

Some Ricinulei (Arachnida)  
from Ivory Coast, including a new species  
and a note on the immature stages of  
*Ricinoides westermanni* (Hansen & Sørensen)

by

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With 6 figures

ABSTRACT

The present paper includes further notes on immature stages of *Ricinoides westermanni* (Hansen & Sørensen) and the description of *Ricinoides megahanseni* n. sp. from the Forêt de Taï.

INTRODUCTION

Over the past five years three species of *Ricinoides* Ewing, 1929 have been added to the list of six (see TUXEN 1974) African Ricinulei (THORELL 1892) (LEGG 1976a, 1977a), bringing the total to nine. There were originally ten species, but *R. plebejus* (Hansen & Sørensen, 1904) was found to be a tritonymph of, and synonymous with, *R. westermanni* (Hansen & Sørensen, 1904) (LEGG 1977b).

Collections frequently contain, or are solely composed of, immature forms and it is necessary to provide a means of identifying these specimens. Consequently, LEGG (1976a, b, 1977a) has published accounts of the sub-adult stages of several species of *Ricinoides*. The present paper includes further notes on immature stages and a description of a new species.

MATERIALS

The specimens of *Ricinoides* were derived from two collections made in Ivory Coast by I. Löbl in 1977 and V. Mahnert and J.-L. Perret in 1980, and deposited in the

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Muséum d'Histoire naturelle of Geneva. They were examined complete, partly dissected and in one case cleared in 10% potassium hydroxide. All measurements are in mm unless otherwise stated.

Both collections were made in collaboration with the Centre suisse de recherches scientifiques en Côte d'Ivoire, Adiopodoumé, and travel of V. Mahnert was supported by the Bourse fédérale de voyage of the SHSN.

### *Ricinoides westermanni* (Hansen & Sørensen)

1. Ivory Coast, Cascade near Man, in leaf litter, 8.III.1977, lg. I. Löbl: a single specimen

Total length (excluding cucullus and pygidium, see LEGG 1976a) 7.3 mm.

Cucullus		Prosoma	
length	2.05	length	2.4
breadth	1.85	breadth	2.5
ratio length/breadth	1.1	ratio length/breadth	0.96
Opisthosoma			
length	5.0		
breadth	4.0		
ratio length/breadth	1.25		

This specimen had a tarsal formula of 1+5+4+5 and possessed a distinct, but incompletely formed genital complex (Fig. 1a) typical of a female *Ricinoides*. These data make the specimen a female tritonymph. The cheliceral setae are arranged in a manner similar to that shown for a different specimen in Figure 1b; cheliceral setal formula 2+(10+6). The pedipalps, like those shown for the specimen depicted in Figure 1b are robust with groups of distal and proximal tubercles, weak 'scales' and ensate setae. Weak navicular setae (scales, see TUXEN 1973) clothe the body and appendages and the leg femora are dorsally sulcated.

2. Ivory Coast, Man, Centre Bethanie, sieving samples (rotten wood, dead leaves), 7.X.1980, lg. V. Mahnert-J.-L. Perret: three specimens. (80/11)

The three specimens collected at Man have the following data:

		<i>Specimen</i>		
		1	2	3
Entire length		5.45	5.9	6.3
Cucullus	length	1.1	1.1	1.4
	breadth	1.6	1.6	2.0
	ratio length/breadth	0.688	0.688	0.7
Prosoma	length	1.92	2.0	2.5
	breadth	2.05	2.1	2.6
	ratio length/breadth	0.976	0.952	0.962

		1	2	3
Opisthosoma	length	3.82	3.9	4.05
	breadth	3.18	3.28	3.5
	ratio length/breadth	1.201	1.190	1.157
Pedipalp	tibia length	1.32	1.33	1.72
	ratio tibia/femur	1.61	1.62	1.61
	Tarsal formula	1+5+4+4	1+5+4+4	1+5+4+5

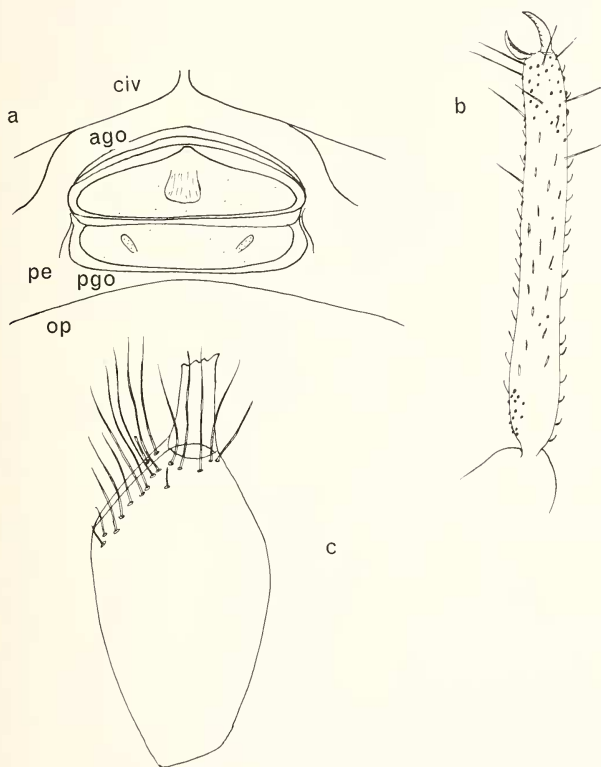


FIG. 1.

*Ricinoides westermanni*: a. female genital area of specimen 8 II 77 Leg. I. Löbl  
 b. prolateral view of right pedipalp of specimen 80/11 Man  
 c. prolateral view of chelicera of specimen 80/11 Man  
 (coxae IV *civ*, anterior genital operculum *ago*, posterior genital operculum *pgo*, pedicel *pe*, opisthosoma *op*)

Each of the specimens were covered in weak navicular setae and tubercles and possessed dorsal femoral sulcations. The pedipalp tibiae (Fig. 1*b*) were covered distally and proximally with groups of tubercles and possessed distally ensate and proximally weakly navicular setae in addition to acuminate sensory setae. The cheliceral setal formula was 2+(10+6), the setae being arranged as shown in Figure 1*c*. These data clearly indicate that these specimens, which were collected not too distant from the preceding one, were immatures of the same species, and included a female tritonymph. With the exception of the cheliceral setal formula, the data suggest that the 4 specimens (three from one collection and one from the other) were *R. westermanni*. However, the *R. westermanni* previously examined (including the type of *R. plebejus*) (LEGG 1977*b*) have cheliceral setal formulae of 1+(6+2). Until adults can be collected from Man, Ivory Coast, a definite statement as to the identity of the species cannot be made. Until then the four specimens are provisionally placed in *R. westermanni*.

### *Ricinoides megahanseni* n. sp.

Data: Ivory Coast, Forêt de Taï, near Scientific Station, sieving in rotten wood and dead leaves, 17.-20.X.1980, lg. V. Mahnert-J.-L. Perret: 1 specimen (80/21), two specimens (80/22), two specimens (80/25).

The specimens collected from Taï proved to be quite distinct from any previously described species and were consequently accommodated in a new species *R. megahanseni*. There are so named because of their close similarity with *R. hanseni* (LEGG 1976) but larger size. No male was found in the collection which consisted of two protonymphs, two larvae and an adult female (Fig. 2).

Data:	specimen				
	1+	2-	3*	4*	5-
Entire length	4.65	1.9	2.0	2.3	2.3
Cucullus					
length	0.91	0.22	0.22	0.26	0.27
breadth	1.2	0.29	0.292	0.338	0.351
ratio length/breadth	0.758	0.759	0.753	0.769	0.769
Prosoma					
length	1.65	0.30	0.29	0.34	0.34
breadth	1.51	0.315	0.31	0.36	0.352
ratio length/breadth	1.092	0.952	0.936	0.944	0.966
Opisthosoma					
length	3.05	0.41	0.41	0.51	0.515
breadth	2.35	0.49	0.49	0.54	0.56
ratio length/breadth	1.298	0.837	0.837	0.944	0.920
Pedipal					
tibia length	1.1	0.222	0.224	0.26	0.253
breadth	0.125	0.02	0.02	0.04	0.04
ratio breadth/length	0.114	0.090	0.893	0.154	0.158
Pedipalp					
ratio tibia length/femur length	1.38	1.41	1.42	1.39	1.42
Tarsal formula	1+5+4+5	1+2+2	1+2+2	1+4+3+2	1+4+3+2
Cheliceral setal formula	1+(3+5)	—	—	—	—

(\*80/22 Taï, +80/21 Taï, -80/25 Taï.)

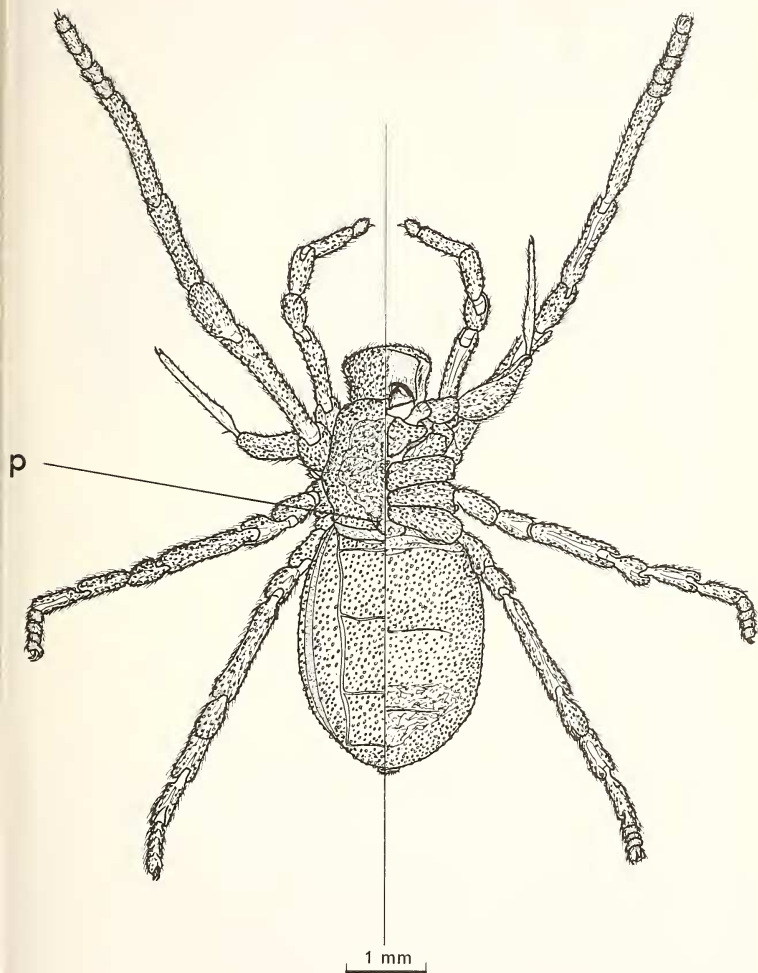


FIG. 2.

*Ricinoides megahanseni* sp. n., female holotype, half dorsal and half ventral views  
(posterior dorsal protruberance of prosoma *p*)

## Holotype female

Navicular setae, similar to, but less strongly developed than, those of *R. hanseni*, clothe the body and appendages. The adult was dark brown with extensive patches of adhering debris. Such material is not uncommonly associated with *Ricinoidea*, particularly adults with the broad setae. Tubercles also occur scattered over the general body surface and appendages. The prosoma bears a small median posterior dorsal

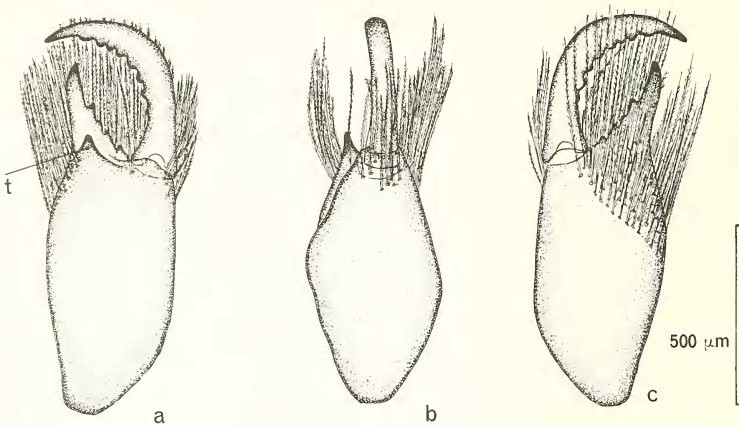


FIG. 3.

*Ricinoidea megahanseni* sp. n., female holotype, views of right chelicera:  
a. dorsal b. lateral c. ventral

protruberance (*p* Fig. 2). Leg femoral sulcations are absent. The chelicerae (Fig. 3) are typically of the genus with a dorsal "Ricinoidea tooth" (*t* Fig. 3.), and possess a distinct cheliceral setal formula (Fig. 3*b*) of 1+(3+5), a single median dorsal and 8 lateral (grouped 3+5) setae. The fixed cheliceral finger has 4 teeth (exclusive of the distal tip) and the movable has 8 teeth. The pedipalpal tibiae are relatively long and thin (Fig. 4, compare Fig. 1*b*) with 5 prolateral distal tubercles. Setae occur throughout the tibia, grading from distally ensate to proximally weakly navicular (Fig. 4*b, c, d*). Distally, adjacent to the fixed and movable fingers, are 14 acuminate setae, several of which have a blunt tip (Fig. 4*a*). Close to the joint between the tibia and femur, the retrolateral-ventral region bears an unusual ampulliform seta (Fig. 4*e*). The fixed pedipalpal finger possesses 4 delicate teeth, a pair distally and a pair proximally (*ff* Fig. 4). The movable finger has 11 irregular serrations along its length. The pedipalpal femur is clothed in tubercles and setae which grade from prolateral ensate to retrolateral navicular.

Distally there is a dorsal area clear of setae and tubercles. Fine prolateral acuminate setae are present, a pair distal and three at intervals along the femur.

Careful "uncoupling" of the prosoma and opisthosoma followed by clearing in potassium hydroxide revealed the structure of the female genitalia. In any description

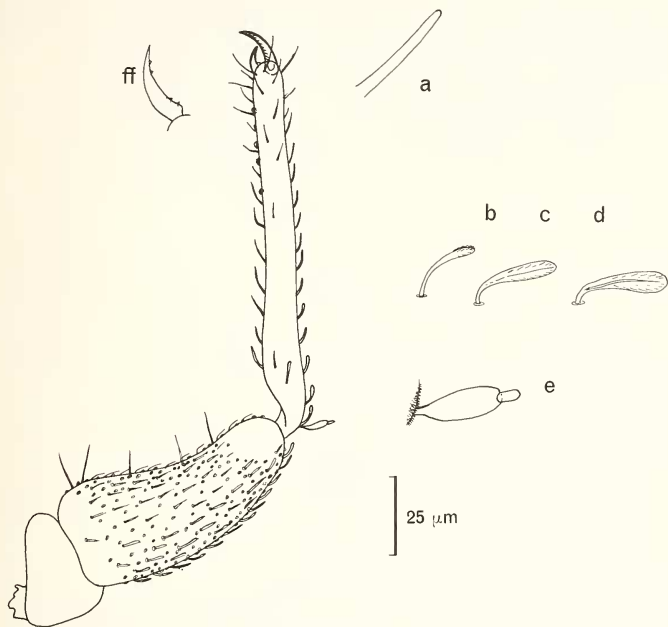


FIG. 4.

*Ricinoides megahanseni* sp. n., female holotype, dorsal view of right pedipalp (fixed finger *ff*, tip of distal tactile seta *a*, gradation of setae: ensate to weak navicular, *b, c, d*, unusual proximal ampouliiform seta *e*)

of a *Ricinoides* it is of paramount importance to demonstrate either the male or female or both, genital and reproductive structures as these are distinct and hence provide reproductive isolation and characterise the species. Few details of the female genitalia have yet been published. Figure 5 shows the structure associated with the genital area which is located on the pedicel (*pe* Fig. 5*c*), between the prosoma bearing the coxae and the opisthosoma (*civ*, of Fig. 5*c*). When "coupled" the anterior and posterior genital operculae cover the genital aperture (*ago*, *pgo* Fig. 5*c*). A complex of vesicular spermathecae open into the posterior dorsal region of the genital atrium (*sp* Fig. 5*a, b, c*). These vesicles are extremely elaborate and difficult to view, hence two additional views

showing the details of the vesicles are given in Figure 5a and b (see Fig. 5d for the orientation: X and Y). There appear to be 7 vesicles on the right and 9 on the left, but this is likely to be a false impression resulting from the preparation of the species and the precise angle at which they were viewed. It is more likely that they are 8 vesicles each side.

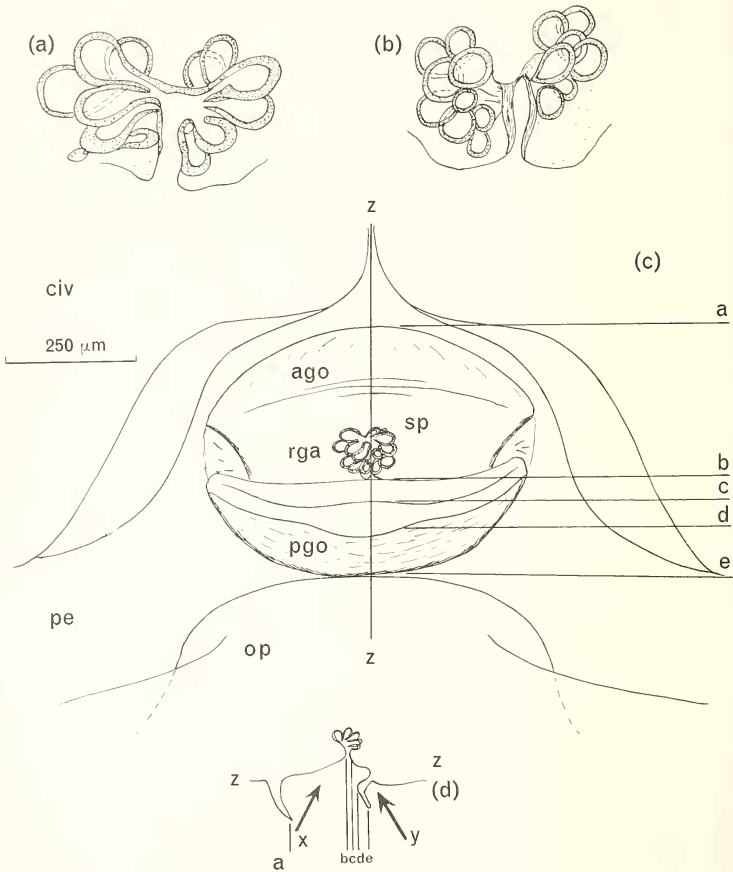


FIG. 5.

*Ricinoides megahanseni* sp. n., female holotype, ventral views of genital area: a, b, details of vesicular spermathecae, viewed from directions X and Y on Figure 5d c. diagrammatic ventral views showing parts of coxae IV (*civ*), pedicel (*pe*), anterior genital operculum (*ago*), posterior genital operculum (*pgo*), roof of genital atrium (*rga*), spermathecae (*sp*) and opisthosoma (*op*)



## Immature Stages

The immature stages examined were typically pale coloured individuals with reduced setation and tuberculation. The data referring to the two larva and two protonymphs have been summarized above.

A comparison of life stages with other species can be made and this is summarised in Figure 6, where estimates of, as yet undescribed, instars are projected for *R. megahanseni* sp. n. and two other species. These projections are based upon the slopes of

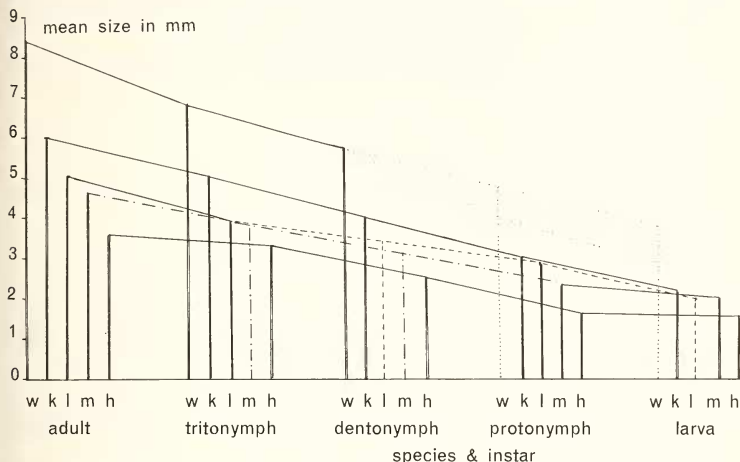


FIG. 6.

Diagram showing actual (solid lines) and estimated (broken lines) sizes of the life stages (adult = mean male + female, tritonymph, deutonymph, protonymph and larva) of five species (*R. westermanni* w, *R. karschi* k, *R. leonensis* l, *R. megahanseni* m. and *R. hanseni* h)

the curves for known life histories (*R. karschi* (Hansen & Sørensen) and *R. hanseni*), and assume equivalent growth rates. Note: for larger species such as *R. westermanni*, it is probable that the curve on the right of the diagram should be steeper, i.e. the protonymph and larva should be relatively smaller (see double dotted line). From this diagram it would appear that the deutonymph and tritonymph of *R. megahanseni* sp. n. should be in the region of 3.2 mm and 3.9 mm respectively. Also, the undescribed deutonymph and larva of *R. leonensis* (LEGG 1977a) should be 3.5 mm and 2 mm respectively. The estimated protonymphal and larval sizes of *R. westermanni* lie within 4.4-4.8 mm and 2.8-3.8 mm.

## Affinities

*Ricinoides megahanseni* sp. nov. appears to be more closely related to *R. hanseni* than any other species (see TUXEN 1974). Features that these two species have in common

include the general colour and shape, the presence of a posterior dorsal prosomal protruberance, and the superficial form of the pedipalps. However, the species is quite distinct: it has a unique cheliceral setal formula, 1+(3+5) (*R. hanseni* 2+3). The pedipalps with their distribution of 5 tubercles (*R. hanseni*, has 4) extensive complex setae (simple setae in *R. hanseni*) and possession of a strange ampulliform seta are further distinctive characters. *R. megahanseni* is, as its name implies, larger than *R. hanseni*, 4.65 mm compared to 3.59 mm, and differences occur in the length/breadth ratios (see data and LEGG 1976a). More significantly, the female genital area is quite unlike any yet described. *R. hanseni* possesses 5 or 6 pairs of vesicles clearly opening on either side of the mid-line (LEGG 1976a) which contrasts with *R. megahanseni* sp. nov. and its complex of 8 pairs opening in the mid-line.

These data suggest an affinity with *R. hanseni* however, until a male is found the precise position of *R. megahanseni* cannot be established.

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#### REFERENCES

- HANSEN, H. J. and W. SØRENSEN. 1904. On two orders of Arachnida: 1-182. *Cambridge University Press*.
- LEGG, G. 1976a. The external morphology of a new species of ricinuleid (Arachnida) from Sierra Leone. *J. Linn. Soc. Zool.* 59: 1-58.
- 1976b. The external morphology of immature stages of *Ricinoides karschi* (Arachnida: Ricinulei). *Bull. Br. arachnol. Soc.* 3 (9): 243-248.
- 1977a. Two new ricinuleids from W. Africa (Arachnida: Ricinulei) with a key to the adults of the genus *Ricinoides*. *Bull. Br. arachnol. Soc.* 4 (2): 89-99.
- 1977b. The status of *Ricinoides plebejus* and a note on *R. afzelii* (Ricinulei: Arachnida). *Bull. Br. arachnol. Soc.* 4 (3): 124-125.
- THORELL, T. 1892. Sopra alcuni Opilioni (Phalangidea). *Annali Mus. civ. Stor. nat. Giacomo Doria* 8: 452-508.
- TUXEN, S. L. 1974. The African genus *Ricinoides* (Arachnida: Ricinulei). *J. Arachnol.* 1: 85-106.
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